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Box 14
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Draft

Greater Sage Grouse Initiative (GSGI)

Data Management Plan: Team Guidance

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Approved by: _____ Date: _____

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1. Introduction

a) The foundation of the Greater Sage-grouse Initiative DMP is based on the ***BLM Manual Handbook H1283-1***, "Data Administration and Management". For more detailed information, please reference that handbook.

b) These instructions are meant to assist GIS specialists in the Field, States, Centers, and the WO support their portions of the GSGI, especially those supporting the Interdisciplinary Teams complete the GSGI' Sub-Regional Environmental Impact Statements (EIS'). This document is intended to cover all aspects of data management for the complete life cycle of the GSGI.

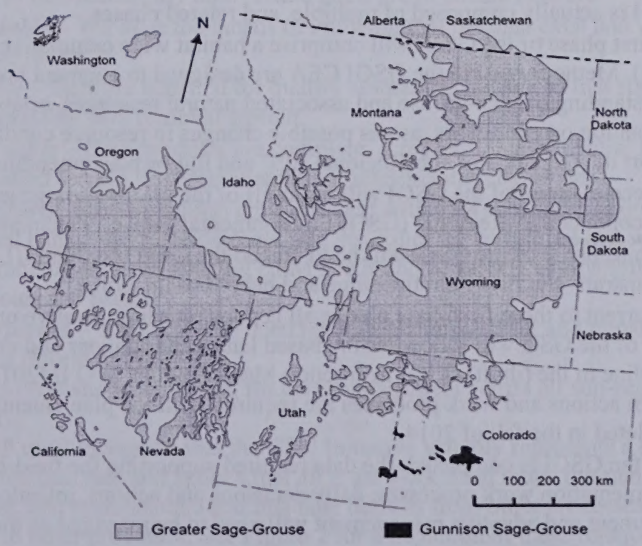
2. Goals of the GSG Initiative

a) To provide consistent and organized information at local, landscape, sub-Regional and national scale to support development of habitat conservation strategies for the GSG on Bureau lands.

b) To inform and complete subsequent land use planning, mitigation evaluations, environmental analyses, and decision-making for other interconnected public land uses and values, including energy development, recreation, fire, livestock grazing, mining, and wild horse and burro management.

c) To establish a defined set of data required to properly manage all resources that the Bureau is responsible for without causing harm and even generating recovery for the GSG across its range (Figure 1).

Figure 1. Schoeder Sage Grouse Range Map



3. **Objectives of GSG Initiative**
   a) Aid in identifying regional priority areas for GSG conservation.
   b) Aid in identifying areas within sub-Regions where development activities (e.g., renewable energy production) may be directed to minimize effects upon important GSG habitats and other ecosystem resources or services.
   c) Aid in adaptation and mitigation planning in response to climate change.
   d) Provide improved predictive capacity regarding the status of important GSG habitats, resources, values, and change agents, and thus facilitate improved project siting, project design, and cumulative impact assessment under the National Environmental Policy Act (NEPA).
   e) Establish baseline information for long-term monitoring of sub-regional GSG habitat components, including soil/site stability, hydrologic function, and biotic integrity.
   f) Provide enhanced sub-regional or landscape-scale information, understanding, and awareness relevant to planning and decision-making for all resource values and uses of public lands.
   g) Facilitate stronger, more effective, and efficient collaboration and cooperation among all parties interested in regional land and resource management.

4. **Overview of GSG Initiative from a Data Management Perspective**
   a) The GSGI is actually composed of a series of activities that will result in the update of all land use plans for BLM Administrative Units that support Greater Sage-grouse habitat.
   b) The GSGI will build on the ongoing Rapid Ecosystem Assessments and AIM projects that the BLM is undertaking as part of a broader initiative to systematically develop and incorporate landscape-scale information into its management of public land resources.
   c) The GSGI is actually composed of multiple, and related phases.
      - The first phase of the GSGI will comprise a habitat wide cumulative effects analysis (CEA). Methods used in the GSGI CEA are designed to augment knowledge and understanding of sage-grouse and associated natural resources, establish baseline information on conditions, assess possible changes in resource conditions, and support development of sub-Regional EIS' and linked plan amendments
      - The second phase of the GSGI will build off of the information generated by the CEA conduct Sub-Regional (GSG) Environmental Impact Statements (SR EIS).
      - The third phase of the CSGI will be to amend the Land Use Plans (LUPs) for all administrative units within the range and habitat of the GSG.
      - Concurrent to these first three phases all actions by administrative units within the range of the GSG will follow NEPA based landscape analysis and decision processes as outline in the (draft) GSGI Instruction Memorandum, WO IM2012-043. These interim actions and work processes are required until the plan amendments are completed in the fall of 2014.
      - Once the GSGI is completed, the data required supporting the field-based implementation work processes; daily decisions and actions, inventory, monitoring, assessment and adaptive management will need to be managed as the corporate assets they are.
   d) With all of these moving parts it is imperative that the data used to support each component are consistent and accessible to all.

- It is mission critical to generate products (maps, reports, analyses) quickly with assurance that the best data is being applied.
- It is important to generate consistent products that are easy to find and use as appropriate.
- It is necessary to ensure that products are created once and integrated across uses versus being generated slightly differently multiple times resulting inconsistent products.
- The processes and data to create these products must be documented in a manner that maintains a record that can be maintained.

5. Goals of the GSG Initiative Data Management Plan

a) The purpose of the Data Management Plan (DMP) is two-fold:
   - To provide guidance to the BLM and its contractors for the collection, use, and storage of data and generated products.
   - To manage the geospatial resources (specialists, data, and technology) in direct support of the GSG Initiative.

b) A goal of the DMP is to ensure that each component of the GSGI receives the analytical and mapping support required in a consistent and timely manner.

c) A goal of the DMP is to integrate and optimize the products generated for different components of the GSGI are available and functionally supportive for each.

d) The goal of the DMP for the GSG Initiative is to manage data as an enterprise manner by integrating resource optimizing data usage, quality, accessibility, information assurance, and understanding while reducing data redundancy and cost across the BLM.

e) To accomplish these primary goals, five underlying goals for data management are required to be successfully met. These goals are to ensure data are:
   - ***Available*** – We have the means of knowing that the data exist and where the data can be found
   - ***Usable*** – Data are certified for quality assurance, and stored in a stable, reliable, and interpretable data retrieval system
   - ***Shareable*** – Data products are complete, screened for confidential information, formatted for use, and documented for interpretation by others
   - ***Integrated*** – Data products are consistent with data standards, interoperable with related natural resource datasets, and are collected and stored in a way that optimizes the tradeoff between meeting BLM needs and achieving compatibility with other agencies and partners
   - ***Interpreted*** – The data have been reviewed, summarized, and transformed into useful information

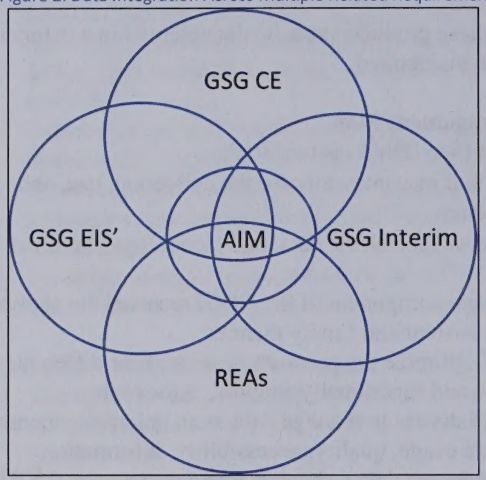
f) Provide a consistent framework for data management across all sub-regions as well as nationally.

g) The DMP must recognize that the GSG Initiative actually represents a series of interrelated analyses and actions that all must work from much the same local, landscape, and regional data and that data derived from other processes can be and are relevant to other processes. See Figure 2 for a depiction of these relationships.

h) While some of the Rapid Ecoregional Assessments started two years ago, their derived data products are just now becoming available this spring.

i) The range-wide Cumulative Effects Analyses, Sub-Regional EIS' and the Interim Action IM all start in 2012 but have different schedules and deliveries.
j) The Assessment, Inventory and Monitoring Strategy represent the data that will be required for future adaptive management and plan modifications.
k) The data management plan must maintain and deliver all of these components.

Figure 2. Data Integration Across Multiple Related Requirements/Processes

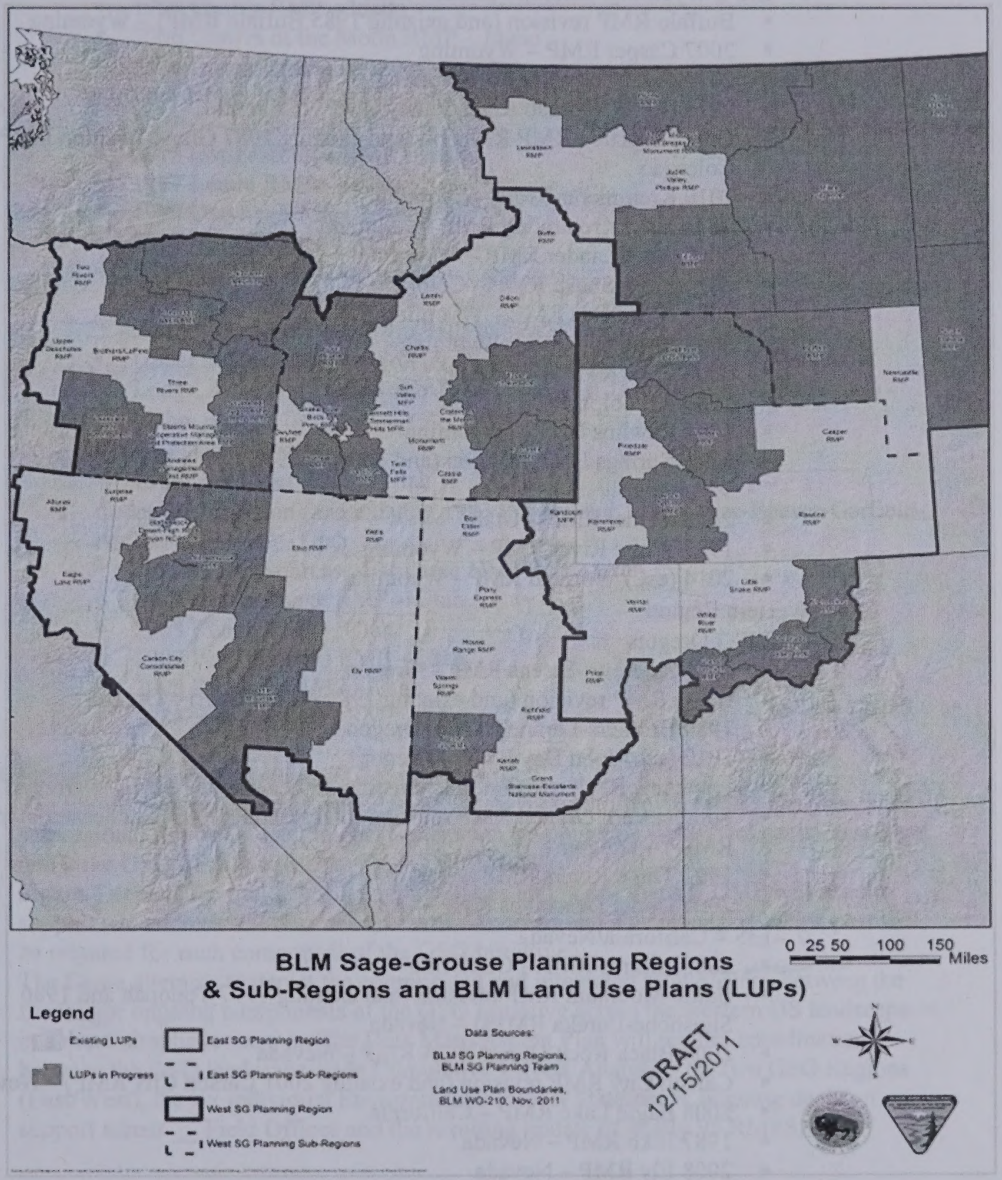


6. Objectives of the GSGI DMP

a) Implement a Bureau-wide "enterprise" approach to data management.
   - Data and products generated in support of any of these efforts depicted in Figure 2, can and should be used repeatedly across efforts.
   - Data and products will be hosted and managed for access and use by all components.
   - Work requests by any of the GSGI teams and management requiring GIS and Data Specialists actions will be approved and managed by direct assignments, organized, tracked and recorded.

b) Conduct data management support for GSGI, recognizing that the same data must be available and applied consistently to each and every task, as appropriate.
c) Manage work consistently across all components of the GSG Initiative.
d) Provide confidence in the integrity, security and availability of sub-regional Environmental Impact Statement assessment data.
e) Ensure easy access to information, and appropriate safeguards for confidential information.
f) Provide awareness of the intended use and limitations of each data set
g) Accommodate infrastructure and documentation that encourages data exploration and scenario development.
h) Facilitate compatibility of datasets for to support step-down activities.
i) Ensure continuity of data for long-term needs such as climate change initiatives and effectiveness monitoring
j) Administer a proper balance between the standards needed to ensure quality and usability, and the flexibility to meet objectives of landscape scale analyses

Figure 3: GSGI Sub-Regions and Planning Areas



- Miles City RMP revision (and existing 1985 Powder River and 1995 Big Dry RMPs) – Montana
- North Dakota RMP revision (and existing 1988 North Dakota RMP)
- South Dakota RMP revision (and existing 1986 South Dakota RMP)
- 2008 Upper Missouri River Breaks NM RMP – Montana

- ◊ EIS 2 Wyoming/Colorado/Eastern Utah
  - Buffalo RMP revision (and existing 1985 Buffalo RMP) – Wyoming
  - 2007 Casper RMP – Wyoming
  - 2014 (est.) Cody RMP – Wyoming
  - 2013 (est.) Colorado River Valley RMP – Colorado
  - Grand Junction RMP Revision (and existing 1987 Grand Junction RMP) – Colorado
  - 2010 Kremmerer RMP - Wyoming
  - 2013 (est.) Kremmling RMP – Colorado
  - 2013 (est.) Lander RMP – Wyoming
  - 2011 Little Snake RMP – Colorado
  - 2000 Newcastle RMP – Wyoming
  - 2008 Pinedale RMP – Wyoming
  - 2008 Price RMP – Wyoming
  - 1980 Randolph RMP – Utah
  - 2008 Rawlins RMP – Wyoming
  - Rock Springs RMP revision (and existing 1997 Green River RMP) – Wyoming
  - 2008 Vernal RMP – Utah
  - 1997 White River RMP – Wyoming
  - 2014 (est.) Worland RMP - Wyoming
- Western Region
  - ◊ EIS 3 Oregon
    - 2005 Andrews-Steens RMP – Oregon
    - Baker RMP revision (and existing 1989 Baker RMP) – Oregon
    - 1989 Brothers-Lapine RMP – Oregon
    - 2012 (est.) John Day RMP – Oregon
    - Lakeview RMP revision (and existing 2003 Lakeview RMP) – Oregon
    - Southeastern Oregon RMP revision (and existing 2003 Southeastern Oregon RMP) – Oregon
    - 1992 Three Rivers RMP – Oregon
    - 2005 Upper Deschutes RMP - Oregon
  - ◊ EIS 4 California/Nevada
    - 2008 Alturas RMP – California
    - Battle Mountain RMP revision (and existing 1997 Tonopah and 1986 Shoshone-Eureka RMPs) – Nevada
    - 2004 Black Rock Desert NCA RMP – Nevada
    - Carson City RMP revision (and existing 2001 Carson City RMP) – Nevada
    - 2008 Eagle Lake RMP – California
    - 1987 Elko RMP – Nevada
    - 2008 Ely RMP – Nevada
    - 2008 Surprise RMP - California
    - 1985 Wells RMP – Nevada
    - 2012 (est.) Winnemucca RMP - Nevada
  - ◊ EIS 5 Idaho/Portion of Montana
    - 2008 Birds of Prey NCA RMP – Nevada

- Bureau RMP revision (and existing 1983 Bureau RMP) – Idaho
- 1999 Challis RMP – Idaho
- 2006 Craters of the Moon RMP – Idaho
- 2006 Dillon RMP – Montana
- Four Rivers RMP revision (and existing 1988 Cascade and 1983 Kuna RMPs) – Idaho
- 2013 (est.) Jarbidge RMP – Idaho
- 1987 Lemhi RMP – Idaho
- 1999 Owyhee RMP – Idaho
- 2011 (est.) Pocatello RMP – Idaho
- Shoshone-Burley RMP revision (and existing 1980 Bennett hills/Timmerman Hills, 1985 Cassia, 1975 Magic, 1985 Monument, 1981 Sun Valley, and 1982 Twin Falls MFPs/RMPs) – Idaho
- Upper Snake RMP revision (and existing 1983 Big Lost, 1985 Medicine Lodge, 1981 Big Desert, and 1981 Little Lost-Birch Creek MFPs/RMPs) - Idaho

◊ EIS 6 Western Utah
- 1986 Box Elder RMP – Utah

◊ Cedar City revision (and existing 1983 Pinyon and 1986 Cedar-Beaver-Garfield-Antimony RMPS – Utah
- 1999 Grand Staircase-Escalante NM RMP – Utah
- 1987 House Range RMP – Utah
- 2008 Kanab RMP – Utah
- 1990 Pony Express EMP – Utah
- 2008 Richfield RMP – Utah
- 1986 Warm Springs RMP – Utah

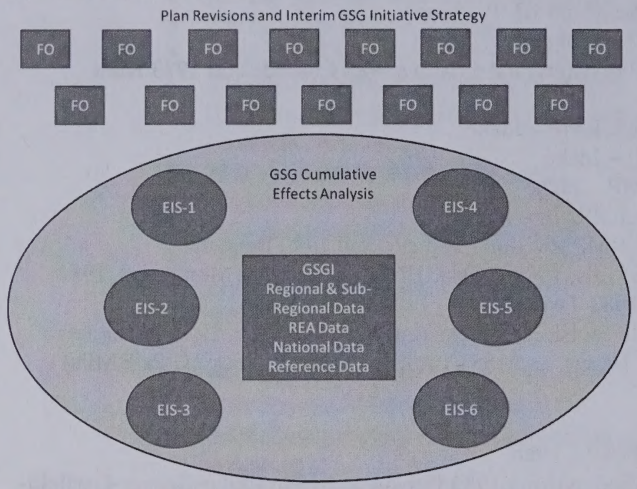
10. Relationship Between Major GSGI components

a) The initial focus of the DMP includes the range-wide cumulative effects analyses, six sub-regional Environmental Impact Statements, and ongoing field-level decision support under the GSG Initiative Interim IM WO2012-043.

b) Figure 4 depicts the multiple overlapping scales and issues that the DMP will need to support and address if it is to be successful. Analysis and data management support will be required for each component of the GSG Initiative.

c) The figure attempts to depict the complicated and integrated relationships between the five major ongoing components of the GSG Initiative across the western US landscape in a more simplistic manner. The Data Management Plan will require coordination between the GSG landscape-wide Cumulative Effects Analyses, the two GSG Regions (East/West), the six individual Environmental Impact Statements, ongoing decision support across __ Field Offices and the resulting update of nearly 95 RMPS.

Figure 4. Related GSGI Processes



d) The GSGI Cumulative Effects Analysis was already initiated.
   - Generating GSG, landscape-scale analyses and derived products to be used by the Regional Scoping processes, serves as input to the Sub-Regional EIS Teams, used by the field in support of their ongoing actions and in their amended RMPs.

e) The GSGI Sub-Regional EIS Teams have been identified by their organization and work processes are just now being initiated with the GSGI Scoping process.

f) Communications and integrated data management in support of these separate GSGI components represents a difficult, but manageable task, if a unifying strategy (enterprise based data management strategy) is implemented to coordinate actions and manage work.

g) To support these ongoing and related efforts, GIS/Data Management Team leads will be integrated into the GSGI organization structure to ensure direct support to individual GSGI subcomponents and to coordinate work assignments.

11. Work Assigned to the NOC DRS Wildlife Lab

a) Implement GSG Initiative Data Management Plan
b) Utilize REA data as appropriate and available
c) Utilize BLM National data as appropriate and available
d) Utilize non-BLM Reference data as appropriate and available
e) Generate Regional and sub-Regional Cumulative Affects Products
f) Science-based analytical processes
g) Derived geospatial landscape data
h) Maps
i) Reports
j) Completion by August, 2012

12. Work Assigned to Sub-Regional Interdisciplinary/GIS Teams

a) Implement GSG Initiative Data Management Plan
b) Utilize GSGI CA Strategy data as appropriate and available
c) Utilize REA data as appropriate and available
d) Utilize BLM National data as appropriate and available
e) Utilize non-BLM Reference data as appropriate and available
f) Utilize local, sub-Regional data as appropriate and available
g) Generate sub-Regional and Regional impact assessment Products
   - Science-based analytical processes
   - Derived geospatial landscape data
   - Maps
   - Reports
h) Use ePlanning for document management
i) Sub-Regional Alternatives generated by June 30, 2012
j) Sub-Regional Alternatives analyses of effects by September 30, 2012
k) Draft sub-Regional EIS by December 31, 2012
l) Final sub-Regional EIS Published in late 2014

13. GSGI Land Use Plan Amendments

a) Assigned to FO staffs with support by NOC DRS/DRIM
b) Tier off of the Sub-Regional EIS'
c) Utilize local data as appropriate and available
d) Generate products from the sub-Regional at the scale required
   - Science-based analytical processes
   - Derived geospatial local and landscape data
   - Maps
   - Reports
e) Plan Amendments are completed in late 2014

14. GSGI Interim IM

a) Assigned to FO staffs with support by NOC DRS/DRIM
b) Implement State or National data management plans as appropriate
c) Utilize GSG Initiative sub-Regional EIS data as appropriate and available
d) Utilize GSGI CA Strategy data as appropriate and available
e) Utilize REA data as appropriate and available
f) Utilize BLM National data as appropriate and available
g) Utilize non-BLM Reference data as appropriate and available
h) Utilize local data as appropriate and available
i) Generate products for NEPA at the landscape level
   - Science-based analytical processes
   - Derived geospatial local and landscape data
   - Maps
   - Reports
j) GSG Interim IM to be followed until Plan Amendments are completed in mid-2014

15. GSGI Strategy Implementation

a) Initiate post EIS RODS and Plan Amendments, mid 2014
b) Assigned to FO/SO/WO staffs with support by NOC DRS/DRIM
c) Define BLM/USFWS data requirements
d) Maintain frozen data and work areas for administrative record, archive as appropriate
e) Maintain and publish reference and decision data as required to support implementation
f) Update BLM National data sets as required
g) Update external reference data as required
h) Implement Assessments, Inventory and Monitoring (AIM) in support of adaptive management
i) Update data and plans as necessary and appropriate under adaptive management

16. GSG Initiative Organization Roles and Responsibilities

a) The management roles of the GSG Initiative Team (as shown in Figure 5) are further described in Table 1.

Figure 5. GSG Initiative Organization Roles and Responsibilities

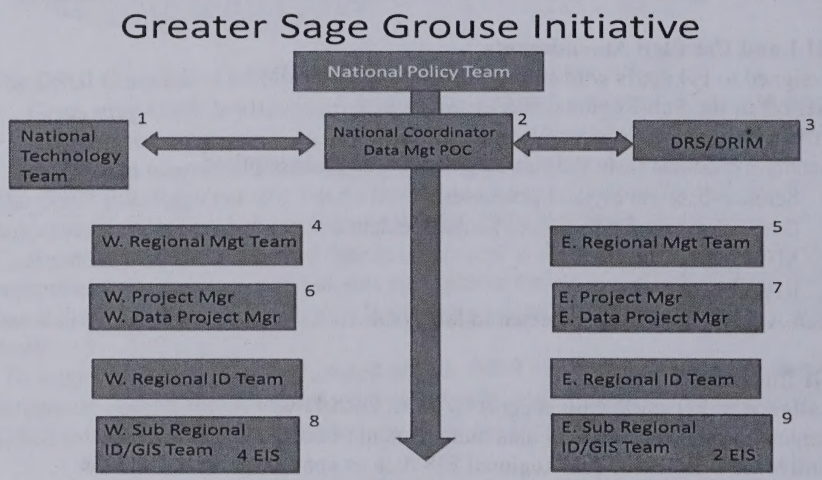


Table 1: GSG Initiative Organizational Roles and Responsibilities (Table is still incomplete, consider a work in process)

Role	Who	Responsibility
National Policy Team	Cross-section of upper-level managers (e.g., ELT, FC, AD/DAD, DSDs).	This group provides oversight for the BLM's National Greater Sage Grouse Initiative strategy to ensure that the program meets the needs of the BLM, especially the needs of the field. The National Policy Team (NPT) will provide overall national policy guidance throughout the planning process. After the initial planning effort, the NPT will continue to monitor the planning process and development of Records of Decision as well as implementation of the regulatory mechanisms.
National Technical Team		The National Technical Team (NIT) serves as an independent, technical and science-based team and serves in an advisory capacity only to ensure the best information related to greater sage-

		grouse management is fully reviewed, evaluated and provided to the BLM for consideration in the land use planning process.
National GSGI Coordinator and Data Manager Point of Contact	Jessica Rubido Duane Dippon	Work together to ensure that Regional and sub-regional teams/processes are working and that the National Policy Team is kept informed.
Regional (E/W) Management Team	BLM State Directors from affected States plus similar upper managers from partnering Ageniesy	The Regional Management Teams (RMT), East and West are established to reflect the uniquely different threats to the greater sage-grouse across its range. The role of the RMTs is to provide overall leadership and guidance for the planning process to ensure that adequate conservation measures are developed and incorporated into RMP amendments and revisions.
E/W Regional Project Manager and Data Project Manager		The Regional Project Managers (PM) will lead the Regional interdisciplinary Teams (RIDT) and attend sub-regional public and cooperator meetings to ensure consistency across their respective regions. The PMs will also act as advisors and consultants to their respective Regional Management Teams (RMT) and ensure that RMT direction and decisions are incorporated into the planning efforts. Regional Data Project Manager to organize and provide integrated DMP support.
Regional Interdisciplinary Teams (RIDTs), East and West		The Regional Interdisciplinary Teams (RIDTs), East and West are also established to reflect the uniquely different threats to the great sage-grouse across its range. The primary role of the RIDTs is to ensure consistency between the Sub-regional Interdisciplinary Teams (SIDT) (e.g., use of information, data, mapping, analyses, management actions and assumptions), to the maximum extent practical
Sub-Regional Interdisciplinary and GIS Teams	Subject matter experts from State and Field Offices within each sub-region, supplemented by NOC SMEs and agency partners	Provide the sub-regional analyses to transform goals, objectives, management planning considerations, and conservation measures into the necessary regulatory mechanisms to conserve the greater sage-grouse on BLM-administered lands within and across the respective states and WAFWA management zones within their respective regions. The SIDTs will complete the required National Environmental Policy Act (NEPA) analysis (EISs) to develop the new or revised regulatory mechanisms, through RMPs
NOC Management \Coordination Team	NOC and Division of Resource Services (DRS) management	Core Data Management Team support with eGIS hardware and software on which data is to be centrally organized and managed. Ensures that the NOC provides adequate personnel resources to accomplish REA responsibilities.
Data Management Team (DMT)	The DMT resides within the Branch of Resource Data (OC-530) in the DRS. The team leader is a member of the NOC Coordination Team.	Provides the overall coordination, development, and management of the eGIS data management platform, under the guidance of the NOC Management/Coordination Team.
NOC Wildlife GIS Team	Contractors performing services under the BLM's IDIQ contract or through other contracting vehicles including interagency agreements.	Conduct requested professional services required to conduct REAs. Collect and evaluate available information, research, data, and models; conduct the assessment.

17. Six Questions to Define GSGI Data Requirements

a) Currently unknown. The Bureau has access to a wide range of geospatial data that can be supportive of the GSGI processes, but the data requirements have yet to be fully defined.

b) A standard data requirements process (see an *example* below) needs to be conducted quickly to document workload expectations and the data required.

- **Analytical Question**
  - ◊ *What levels of potential (suitable and non-suitable) sage grouse habitat are available under each alternative?*
- **Analytical Assumptions**
  - ◊ *Sage grouse is a wide-ranging species that requires a variety of habitat types within the sagebrush community*
  - ◊ *Sage grouse habitat is comprised of sagebrush-steppe between 4,000 and 8,000 feet in elevation, having an annual precipitation of 10-16 inches, and topography that is rolling with slopes less than 30%.*
  - ◊ *BLM Technical Manual 417 (2005) defines five classes of big sagebrush:*
  - ◊ *No sagebrush (canopy) cover*
  - ◊ *Trace to 5 % sagebrush cover*
  - ◊ *Greater than 5-15% sagebrush cover*
  - ◊ *Greater than 15-25% sagebrush cover*
  - ◊ *Greater than 25 % sagebrush cover*
  - ◊ *Sagebrush classes 3, 4, and 5 are ecologically important to sage grouse life history requirements*
  - ◊ *Class 3 is important for brood rearing*
  - ◊ *Class 4 and 5 is important for nesting/sever winter habitat*
  - ◊ *Lek sites my include: Landing strips, old lake beds or playas, low sagebrush flats, opening on bridges, roads, cropland, and burn areas*
- **Analytical Methods and Techniques**
  - ◊ *Quantify potential habitat using Ecological site inventory, Forest operations inventory, lakes and hydrology coverages*
  - ◊ *Analytical Methods and Techniques*
  - ◊ *Quantify potential habitat using Ecological site inventory, Forest operations inventory, lakes and hydrology coverages*
  - ◊ *The conservation strategy for sage grouse in Oregon states that 70% of the sage grouse range should be managed for sagebrush, so 70% will be the standard to use to compare alternatives.*
  - ◊ *Habitat quantities will be modeled at years 0, 10, 20, 30, 40, 50, and 100 for all alternatives. Ten year and 100 year timeframes represent short and long-term impacts; 20-50 years represents an intermediate timeframe useful for determining speed of recovery/ stability.*
- **Analytical Conclusions**
  - ◊ *Relative value of each alternative at developing and maintaining sage grouse habitat as measured by changes in the percentages of suitable habitat, disturbance, patch size, and connectivity.*
- **Expected derived Products**

- ◊ A simple summary number – *total BLM acres*
- ◊ Maps – *maps of suitable and non-suitable habitat for the range of the GSG*
- ◊ Reports – *Acreage of suitable and non-suitable habitat by Region, Sub-Region, and by field office*
- ◊ Derived geospatial data – *geodatabase(s) of the summary geospatial data described by meeting the analytical requirements listed above.*

- **Analytical Conclusions**
  - ◊ *Relative value of each alternative at developing and maintaining sage grouse habitat as measured by changes in the percentages of suitable habitat, disturbance, patch size, and connectivity.*

c) Until these six questions are defined for every issue to be addressed by the following, the data requirements will continue to expand and evolve:
- GSGI Cumulative Effects
- GSGI National Policy Team
- GSGI Regional Management Teams
- GSGI Sub-Regional EIS Teams
- Field Offices in response to the GSGI Interim IM WO-2012-043
- Field Office Plan Amendment Teams
- Programs implementation of the final RODS

d) The GSGI Data Management Team will work with the GSGI Management hierarchy to define these questions.

e) The resulting requirements will be assigned to individual analysis.

f) The completed sets of questions represent the "work-book" which can be assigned to the Bureau's geospatial and data management specialists.

g) The resulting assignments will be tracked in a SharePoint database under the GSGI SharePoint site so that everyone will be able to track accomplished and ongoing work.

h) The underlying coordination goal is to identify work requirements and ensure that the resulting products can be applied at their proper scale and scope and to prevent multiple efforts to generate similar but different products for the same, or nearly the same landscape or issue.

18. GSG Initiative Organizational Structure

a) Data Management Point of Contact
- works for and with National GSG Coordinator
- works for and with Regional GSG Project Managers
- Coordinates NOC, State GIS, and GSSP/eGIS assets
- Supports Public Affairs WO

b) NOC DRS
- GSG Cumulative Effects Wildlife Team
- GSGI Data Management Core Team
  - ◊ Augmented by virtual team of specialists
  - ◊ Augmented by contract support for scarce skills
- National Data Management (GSSP Implementation)
- External Reference Data Management
- REAs Data Management (see link to REA Data Management Plan)

- Internal/External Web Services Content Development Core Team
  - ◊ Augmented by virtual team of specialists
  - ◊ Augmented by contract support for scarce skills

c) Web Services Team
- Internal
- External
- Ensures that the data presented has been cleared to the appropriate level of use

d) NOC DIRM
- Provides infrastructure support
  - ◊ Network
  - ◊ eGIS infrastructure (Citrix farm & data servers)
    - ▪ Systems Administration
    - ▪ Database Administration
  - ◊ Internal Web Services infrastructure
  - ◊ External Web services infrastructure
- Provides software support
  - ◊ SharePoint, ArcGIS, ArcServer, ArcSDE, Citrix, Oracle

e) Western/Eastern Data Project Managers
- Coordinates requirements definition as listed under **Section 17**
- Defines tasks, coordinates across Sub-Regions and with DMP POC to assign & track tasks and work processes
  - ◊ Some geospatial tasks covers multiple sub-Regions
- Integrate data for GSG CE Strategy across all appropriate landscapes
- Work/task order manager, coordinates sub-Regional EIS data/analysis integration
- Works for and with W/E Project Managers
- Integrates requirements from multiple EIS'
- Eastern – tbd_____
- Western – tbd_____

f) Sub-Regional ID/GIS Team Leads
- Defines requirements for each EIS with ID Teams
- Coordinates work requirements w/Regional Project Mgr./Data Project Mgr.
  - ◊ NV/CA – Mark O'Brien
  - ◊ Utah – Jerry Sempek
  - ◊ Idaho – Rod Collins
  - ◊ Oregon – Jeanne Keyes
  - ◊ Montana – _____
  - ◊ Wyoming - _____
  - ◊ Colorado – Ken Schauer

19. GSG Initiative SharePoint-based Work/Task Management Database

a) Create and maintain a database in SharePoint to record and track each and every GIS and data task.
- Responsibility of the GSGI DMP POC

- Records the individual with the assignment and the location of any and all generated products.
- Creates the Record of what was done and by whom.

b) Managed and maintained by the GSGI DMP POC in conjunction with the Western/Eastern Data Project Managers.
- Each and every GIS and data task must have a defined customer and must be approved by one of these individuals.
- All requests for maps, tables, numbers, data release, data acquisition, derived data generation must be approved and assigned by one of these individuals.
- Used to manage the workload by the GIS/Data Management Team.
- Ensures that required work is assigned and accomplished once.
- Ensures that the proper source materials can be found, accessed and used.

c) Create and Status Database and Maps, as required to support the GSG Initiative National and Regional Management Teams; maintained by appropriate GSGI Leads
- Sub-Regional EIS Status Database and Maps
- Land Use Plan/RMP Status Database and Maps

20. Data Management Plan Team (DMPT) and Responsibilities

a) The following positions were identified as the core members of the REA DMT and will need to be adjusted and integrated into one overall GSGI DMPT.

b) While the data for the GSGI Cumulative Effects and Sub-Regional EIS processes will be centrally located and housed at the NOC, the team members assigned duties in support of the plan can and will be located in their home office across the Bureau, representing and working as a virtual team.
- Data Coordinator
  - ◊ Coordinate data sharing and data management activities
  - ◊ Implement the DMP
  - ◊ Provide oversight during development of projects and contracted services to ensure the data needs and requirements are documented
  - ◊ Ensure resources are available for data management activities
  - ◊ Determine what data will be maintained consistent with the objectives of the GSG Initiative
  - ◊ Accountable for all aspects of data within their program or geographic area. Includes responsibility for quality, accessibility, completeness, timeliness, accuracy, and standards.
  - ◊ Establish quality assurance and quality control requirements
- Data Architect
  - ◊ Be active advocate of data management
  - ◊ Ensure official agency records requirements are being met
  - ◊ Provide information management leadership, data modeling expertise, and custodianship of the data models
  - ◊ Serve as representative to data standards committees; support national efforts as required
  - ◊ Ensure adherence to Bureau requirements for metadata and data standards in project or contracted services

- ◊ Document business rules and data standards
- GIS Administrator
  - ◊ Establish data access security requirements both internally and externally
  - ◊ Manage databases including those containing spatial data
  - ◊ Provide data dissemination
  - ◊ Accountable for integrity and quality of business data
  - ◊ Lead for maintaining the eGIS Information Platform
  - ◊ Provide server-side GIS administration
  - ◊ Provide programming support
- Data Management Specialist
  - ◊ Manage eGIS Data Catalog infrastructure
  - ◊ Accountable for integrity and quality of data
  - ◊ Responsible for data requirements, standards, access rules, data quality, business rules, and other data activities within their area of expertise
  - ◊ Implement quality assurance and quality control requirements
  - ◊ Ensure that information meets the customer needs
  - ◊ Ensure data documentation is developed and maintained including FGDC metadata
  - ◊ Accountable for integrity and quality of business data
  - ◊ Create and maintain metadata to quality specifications
  - ◊ Manage databases including those containing spatial data
  - ◊ Be aware of resource data requirements, standards, access rules, and training
  - ◊ Work with data stewards and data administrator to interpret business needs into applications and derive data requirements
- Wildlife Habitat Spatial Analysis Lab
  - ◊ Provide spatial analysis and modeling expertise
  - ◊ Provide support to GSGI DMPT when capacity begins to be exceeded
  - ◊ Serve as GIS technical support to the overall GSGI
- BLM Geospatial Data Coordinator
  - ◊ Software/Hardware Versioning Control and Updates Schedule
  - ◊ Support integration of data into the EGIS ArcSDE framework
  - ◊ Support Geodatabase design and modeling activities
- IT Security Manager Responsibilities
  - ◊ Monitor and assure information confidentiality, integrity, and availability
  - ◊ Establish IT administration privileges
- Contractor Roles
  - ◊ Perform services under the BLM's IDIQ contract (or through other contracting vehicles including interagency agreements), have the responsibility to use professional practices to complete their duties to ensure the integrity of all data created or edited for the effort
  - ◊ Perform all data compilation, analysis, initial QA/QC, and delivery of products as assigned
  - ◊ Provide data management support services as needed on-site at the NOC
- Partner and Cooperator Roles

- ◊ Partner agencies and other cooperators play an important role in assisting the BLM with data products or scientific models that may avoid duplication of effort, save taxpayer dollars, and to strengthen the scientific validity of the GSG Initiative.
- ◊ The efforts by the partner agencies to complete their products to professional, federal standards prior to release to the BLM, is recognized and appreciated. This spirit of collaboration will be reflected in a stronger scientifically valid Cumulative Effects, Sub-Regional EIS and ROD Implementation products.

21. NOC IT Infrastructure and Systems Architectures (This section to be updated by DRS)

a) All GSGI data deliverables will be managed out of the NOC in Denver, CO.

b) GSGI activities are coordinated with the Geospatial Services Strategic Plan (GSSP), which BLM developed to nationally coordinate a broad range of geospatial activities within the Bureau. Much of the internal hardware/software systems that will support the GSGI are leveraging the same systems that fall under the GSSP.

c) Servers
- All IBM Blades have 72 GB RAM.
- 5 IBM Blades (64 bit MS Server 2003) dedicated to Citrix 4.5, with VMware management
- 2 IBM Blades dedicated to ArcGIS Server 10.0 with Image Server and GeoPortal extension
- 1 IBM Blade dedicated to SQL Server 2005
- 1 Sun Blade dedicated for Oracle 10G and ArcSDE 10.0

d) Storage
- The NOC has multiple storage mechanisms in place depending on the level of security and sensitivity of data
- Vector and Tabular data will be stored in ArcSDE using an Oracle back-end. BLM's Storage Area Network (SAN) is used for these data types.
- Raster data will be stored on BLM's Tier-2 system. Currently more than 20 terabytes of space are available for geospatial raster datasets.

e) Software
- Backbone of BLM's geospatial software is Commercial-Off-The-Shelf (COTS)-based
- The primary suite of GIS software is based on ESRI product line
- Software tools to be used at the NOC include ArcGIS 10.0, ArcSDE 10.0, ArcGIS Server and extensions 10.0, Oracle 10G
- Other software that will typically be used by BLM for these REAs include Data Flux, MS SharePoint, Citrix application servers, and Google Earth

f) COTS Update Schedule
- GSGI will follow the software upgrade schedule laid forth by the GSSP. Scheduling will be coordinated with the Geospatial Data Coordinator.
- New software that does not already exist on BLM's Configuration Management (CM) baseline takes months to get approval. Team members are discouraged to developed datasets and other GSGI products that would require new software to have to be installed on BLM hardware.

- Team Members should notify the GSGI Data Management POC of any custom tools or programs developed for these assessments that are to be installed on BLM systems as early as possible to give the BLM time to go through our CM process.

22. Web Services

a) Web Services capabilities represent a standard technology already provided within the COTs software that the Bureau owns and uses to support its mission. The Bureau has been implementing these capabilities on a limited basis for the past decade.

b) Internet Access

- The National Policy Team and the Regional Management Teams need to define their expectations and requirements for providing geospatial data and interim products to the GSGI's collaborating agencies, partners and the public at large.
  - ◊ Multiple options exist for providing access to data used and generated in the GSGI, some can be implemented relatively quickly and all have distinct functionalities and capabilities.
- With the closure of GeoCommunicator, the Bureau only has a very limited capability to serve geospatial data outside of BLM's firewall as directed by the ITIB and by Information Memorandum.
  - ◊ If this level of interaction and collaboration is not required to support the GSGI and NEPA, then this is not a risk.
- The Geospatial Information Portal (GPI) Project is working through the ITIB Application Development Approval Process to re-establish these services.
  - ◊ Given the GPI proposed timeline, it is expected that the Bureau will lack an ability to directly serve geospatial data outside of the BLM's firewall before the end of 2012.
  - ◊ If this level of interaction and collaboration is required to support the GSGI and NEPA, then this represents a risk to the project.
  - ◊ This issue will need to be resolved as quickly as possible by the GSG National Policy Team with the ITIB.
- Geospatial data from external sources can be acquired and used by the Bureau through multiple processes, including map services streaming data from the USFS, USGS, NPS, and USFWS.

c) Intranet Access

- The Bureau currently maintains and uses internal web services by individual States and at by the NOC DRS.
- Using existing technology and COTS software the Bureau already owns, the DMP envisions the use of Internal web services to support the GSG Initiative by:
  - ◊ Providing all of the GSGI Teams and Management with a simple geospatial data viewer to allow simple interaction (view, map, find) with the data used, supporting and generated by the GSG Initiative.
  - ◊ Supporting the GSGI Teams and Management generate simple map products without having to find and assign the map making task to a GIS specialist.

- ◊ Providing the Field with the ability to view landscape data as they work under the GSGI Interim IM and conduct NEPA at a landscape scale to support their decisions and actions.
- The same data centrally located at the NOC can be used for analysis while also available for "streaming" via the internal web service to ensure that data versioning is not compromised.

d) GeoPortal Represents an existing internal web service that could be updated by linking it to the metadata and geodatabases used/generated in the GSG Initiative.

23. GSGI Geospatial Team Work Process

- All requests for maps, analyses, reports, data development, or data calls must be approved and logged into the DMP SharePoint database analysis before the request is assigned and acted on.
- Assigned work areas are located at the NOC and work will be accomplished on the eGIS citrix farm with generated work products stored in assigned work areas and tracked via the SharePoint database.
- Inclusion of all associated work by assigned task will be maintained in the assigned work area.
- Derived geospatial products will be made available as appropriate a.s.a.p.

24. Existing Data Sources and Data Standards

a) BLM Data and National Standard Data

- BLM does not currently have data standards for all corporate datasets
- Data used in the GSGI should however follow and meet any existing standards from BLM, FGDC, or other federal agencies if those standards do exist
- Data used in the assessment process may be a defacto standard based on its use and should be documented to support future data re-use and collection of matching data for future use
- A large part of data standards efforts deal with documentation. If data are used that do not have an already documented standard, then efforts must be made to ensure that all entities (features) and attributes are completely and accurately defined and documented in the FGDC metadata so that other data can be merged to the existing data set in the future.
- Table 2 is a list of Pending or Existing Geospatial Data Standards

Table 2: BLM Geospatial Data Standards Status (Table is "in process" and incomplete)

BLM Dataset	BLM Standard	National Dataset
Grazing	Yes	FY10
Areas of Critical Environmental Concern	Yes	FY10
Public Land Survey System	FGDC: Cadastral	June FY10
Surface Management Agency	No	Interim[4]

National Landscape Conservation System	Pending[1]	FY10
Transportation	No	FY10
Core Sage Grouse	No	June FY10
Wild Horse and Burro	Pending[1]	Interim[4]
Trails	FTDS	No
Land Health	Yes	No
Admin Boundaries	Pending[1]	Interim[4]
State Boundaries	No	Yes
Invasive Species		
Infestation location	Draft[2]	Yes
Survey Area	Draft[2]	Yes
Treatment Boundaries	No	Yes
Weed Management Areas	Pending[1]	Yes
Visual resource Inventory	Pending[1]	No
Riparian Areas	Draft[2]	No
Proper Functioning Condition	Draft[2]	No
Taylor Grazing Act	Pending[1]	No
Land Use Planning Boundaries	Pending[1]	Interim[4]
Land Use Planning Decision Boundaries	Scoping[3]	No

1) Pending BLM Standard means that the Data Standard Process will be completed in FY10.

2) Draft status means the standards process has begun and a Draft has been created. However the process is not as far along as "Pending".

3) Scoping mean there are plans to start the Data Standards process in the very near future.

4) An Interim national layer means a dataset has been compiled, but it does not meet the standard and may need updating.

b) External Reference Data (examples include)

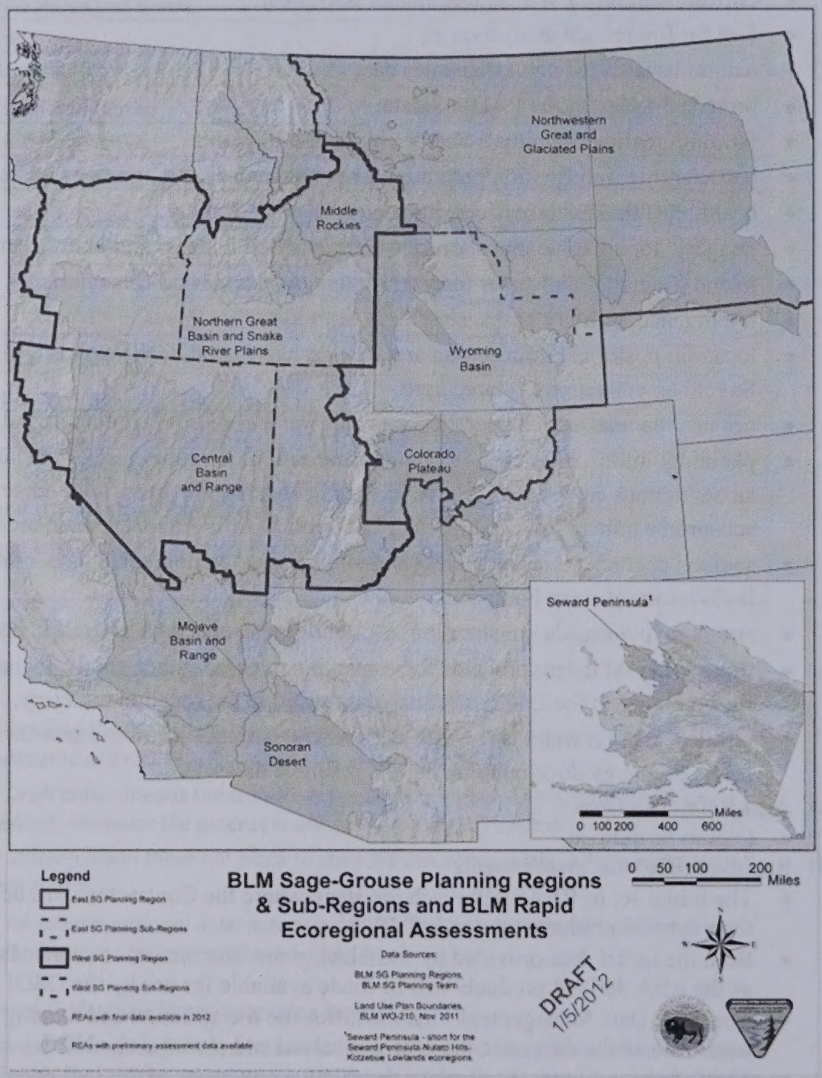
- biota: flora and/or fauna in natural environment, includes land cover data. Subdirectories by species name for data with only one species. For collections of data with more than one species, organize in subdirectories by name of the resource, for example, "NaturalHeritageProgramData"
- boundaries: legal land descriptions. The ESRI Streetmap collection is stored here.
- climatology: processes and phenomena of the atmosphere

- economy: economic activities, conditions, and employment
- elevation: height above or below sea level and elevation derivatives
- environment: environmental resources, protection and conservation.
- criticalhabitat for FWS critical habitat polygons,
- Fire for fire related analysis,
- natural hazards for natural disaster data
- protected areas for the PAD-US data.
- farming: rearing of animals and/or cultivation of plants
- geoscientific: information pertaining to earth sciences, e.g., geology, soils
- health: health, health services, human ecology, and safety
- imagery: topographic maps, imagery, unclassified images, digital ortho images
- inlandWaters: inland water features, drainage systems and characteristics
- intelligence: military bases, structures, activities
- location: positional information and services. Cadastral, GNIS points and the ESRI Streetmap collection is stored here.
- oceans: features and characteristics of salt water bodies (excluding inland waters)
- planning: information used for appropriate actions for future use of the land. This is an ambiguous category. We have included conservation areas, wild horse areas, subsurface mineral ownership, the PLSS, and WAFWA management areas.
- society: characteristics of society and culture, e.g., demographic data, crime data. Includes the Human Footprint
- structure: man-made construction, e.g., buildings, museums, churches, housing
- transportation: means and aids for conveying persons and/or goods. Includes layer files pointing to the ESRI streetmap data saved in the location directory.
- utilities: energy, water and waste systems and communications. Includes multiple forms of energy development, natural resource datasets.

c) AIM Reference Data
   - (Yet to be defined)

d) Rapid EcoRegional Assessments
   - The initial set of REAs will reach the stage where the Contractors will be delivering their derived products by April of 2012.
   - Both the initial data provided by the BLM to the Contractors as source data as well as the REA derived products will be made available for use by the GSGI processes.
   - The REA Data Management Plan identifies the file structure and naming convention used to store the data once the data is received and stored at the NOC.
   - The following Figure (6) displays the relative coverages of the individual REAs and their data versus the GSGI Regions and Sub-Regions.

Figure 6. Rapid EcoRegional Assessments vs. GSGI Regions and Sub-Regions


Northwestern Great and Glaciated Plains
Middle Rockies
Northern Great Basin and Snake River Plains
Wyoming Basin
Central Basin and Range
Colorado Plateau
Mojave Basin and Range
Sonoran Desert
Seward Peninsula¹
Miles
0 100 200 400 600
Legend
East SG Planning Region
East SG Planning Sub-Regions
West SG Planning Region
West SG Planning Sub-Regions
REAs with final data available in 2012
REAs with preliminary assessment data available
BLM Sage-Grouse Planning Regions & Sub-Regions and BLM Rapid Ecoregional Assessments
Data Sources:
BLM SG Planning Regions, BLM SG Planning Team
Land Use Plan Boundaries, BLM WO-210, Nov. 2011
¹Seward Peninsula - short for the Seward Peninsula-Nulato Hills-Kotzebue Lowlands ecoregions
DRAFT 1/5/2012
0 50 100 200 Miles

25. GSGI Geospatial Extent

a) Buffer

- Each sub-regional EIS area of analysis will include all of the BLM lands identified within the RMPs to be updated under the GSG Initiative.

- The GSGI Cumulative Effects Analysis will include all of the affected RMPs

b) BLM-Supplied Inventory of Existing Data

c) Data for Assessments
   - Additional data necessary to complete the information products for each GSGI sub-regional EIS will be determined during Pre-Assessment

d) Projection
   - Geospatial datasets shall use the USA Contiguous Albers Equal Area Conic projection. Projection parameters can be found in Appendix 4.

e) Datum
   - Beginning in 2002, BLM established NAD 83 as a Bureau standard for all active Bureau Corporate digital spatial data (WO IM 2002-066 and subsequently H-1283-1 Data Administration and Management). This Datum has had multiple realizations or epochs developed since that standard was established. Examples include: NAD 1983 CSRS, NAD 1983 HARN, and NAD 1983 CSRS98.
   - Due to each of these epochs being a variation of the base NAD 83 Datum, additional qualifying information is required to be associated with a digital dataset where applicable so that data do not become mixed from various sources. For REAs, this information should be included in the FGDC-compliant metadata for these data.
   - Because many of national datasets to be used for these assessments have not identified a specific epoch, all data layers should use the Standard NAD83 Datum (in ESRI software this is North American Datum 1983.prj)
   - Datum transformations should be executed using WGS84-NAD83 #5 conversion algorithm

f) Scale
   - Specific scale and resolution requirements will be based on the individual decisions in the Sub-Regional EIS'
   - Generally, analyses and data collection need not exceed mapping scales at 1:100,000
   - 30-meter pixel is the default resolution of raster-based analyses

g) Geodatabase Design
   - Each Geodatabase delivered should include design documentation. This may include a UML diagram, or a report listing of any geodatabase properties found in the each of the five key elements of the geodatabase. E.g., 1. Datasets (feature classes or attribute tables) 2. Relationship classes, 3. Domains, 4. Spatial rules, and 5. Map layers. BLM will determine the geodatabase model in consultation with Contractors and AMT during the initial round of Pre-Assessments.
   - A standard database model for the Assessment Output products has not been produced at the time of releasing this document. However, BLM does intend to have a standard database model produced before the Assessment Phase of the first REAs.

h) Map Symbology
   - BLM has a defined color palette for Federal Ownership that contractors will be required to use. The website is: http://www.blm.gov/nstc/mapstandards/colormod.html.
   - BLM's 100K Map Series have a set of cartographic standards that Contractors are requested to follow. These standards are only available in hardcopy format and will be provided during Pre-Assessment.

- Contractors are requested to follow FGDC's Digital Cartographic Standard for Geologic Map Symbolization. The website is: http://ngmdb.usgs.gov/fgdc_gds/geolsymstd.php.
- Contractors are requested to follow USGS Topographic Map Symbol Standards as documented at http://egsc.usgs.gov/isb/pubs/booklets/symbols/
- Existing ESRI Layer files for some common datasets will be provided during Pre-Assessment

i) File Formats

- Raster Data
  - ◊ Raster GIS data shall be delivered as ESRI GRID, ERDAS IMG, or GeoTiFF files. When raster pixels contain multiple attributes, ESRI GRID is the preferred format.
- Vector Data
  - ◊ Vector GIS data shall be delivered as ArcGIS 9.3.x compatible File Geodatabases
- Map Compositions
  - ◊ ArcGIS 10.1 MXD with relative pathnames to data organized in directory structure are provided below in the Directory Structure section
- Map Templates
  - ◊ ArcGIS 10.1 MXT map templates will be provided to contractors during Pre-Assessment to help standardize the map compositions
  - ◊ Contractors can edit these templates to meet the needs of specific map products
- Layer Files
  - ◊ GIS Analysts will provide ArcGIS 10.1 (LYR) layer files for each derived dataset
  - ◊ GIS Analysts should apply recommended and required symbology standards listed in Section 15, Subsection J
- Spatial Models
  - ◊ Spatial models shall be generated as ArcGIS Toolboxes containing models developed in ModelBuilder or using Python scripts
  - ◊ Toolboxes and models should be nested in a directory structure containing the input files and documentation necessary for recreating their results
- Tables
  - ◊ Related attribute tables should be provided with the File Geodatabase and have a relationship class created
  - ◊ Tables not related to spatial dataset should be delivered as MS Access or Excel 2003 files
- Cartographic Products
  - ◊ Cartographic products will be delivered in an Adobe Acrobat GEOPDF format as well as in two hardcopy prints. PDFs should be generated from map documents at 150-300 Dots Per Inch (DPI)
  - ◊ Each hardcopy map product will have one corresponding ArcGIS MXD.
  - ◊ Unless otherwise specified, cartographic products will be designed at the tabloid, or 11 x 17 size. Wall maps will be assumed to be designed at a size of ARCH-E, unless otherwise specified.

26. GSGI High-level Directory Structure

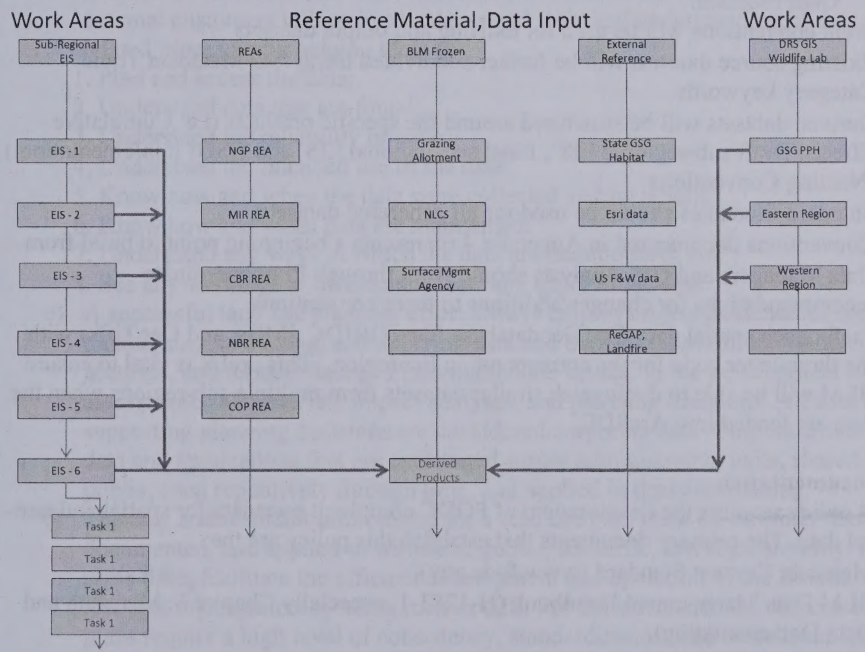
a) Maintaining and using a standard data storage structure for all data assembled, synthesized, and derived during the GSG Initiative will make the process of delivering digital work products to the BLM more efficient, and will enhance future use of the data

b) A standard directory structure (Figure 7) and folder naming convention (see Appendix 4 provides an example the system used for the REAs), which the Data Management and GIS analysts will implement

c) Adhering to this minimum standard structure is required, though modifications suggested by the field will be considered to work-out specific details

d) Data Managers and GIS analysts should work through the DMP POC to coordinate modifications to the standards recommended in this document

Figure 7 Basic File Management Structure under the Data Management Plan for the GSGI



e) Basic Structure

- Level 1:
  - ◊ Each GSGI Sub-Region will have its own root folder using a three digit EIS code.
  - ◊ The NOC Wildlife Lab will have a root folder for their work on the GSGI Cumulative Effects Analysis
  - ◊ The NOC has different digital storage requirements for raster and vector products, therefore a split between these data types are reflected early in the

structure. All of the data provided as reference to the project will be read-only with an identified data of last edit (frozen data date).These data will include both internal- and external-source data.

- ◊ Derived Products:
  - GSGI derived products from the GSGI Sub-Regional EIS' and the Cumulative Effects Analysis, approved and available for use.

- Level 2: For each GSGI Sub-Region and for the Cumulative Effects, work areas by assignment within the appropriate Level 1 work area. Each work area file storage designation will match those in the work assignment database maintained in the GSGI SharePoint site.
  - ◊ Task Subdirectories: Each work area to maintain all relevant generated interim and the final product generated to meet the assignment. Should include documentation of assignment; individual ArcGIS MXD files (final) used to generate reports, numbers, figures and maps; and all related, relevant reference documents, Map Products, Reports, Figures and Models in the form of GeoProcesses.

f) Different conventions will be used for existing and output datasets
- Existing source datasets will be further subdivided using ISO Metadata Topic Category keywords
- Derived datasets will be structured around the specific products (i.e. Cumulative Effects, Draft sub-regional EIS', Final sub-regional EIS, and GSGI Implementation.)

g) File Naming Conventions
- Standard filenames should be used for all generated datasets
- Conventions documented in Appendix 4 represents a beginning point to build from
- Data Managers and GIS Analysts should work through PI to coordinate recommendations for changes/additions to these conventions
- Prefix each spatial data file (Geodatabase files, GRIDs, .IMGs, and GeoTiffs) with the three-letter code for the corresponding Ecoregion. This prefix is vital to ensure BLM will be able to distinguish similar datasets from multiple sub-regions when the data are loaded into ArcSDE.

27. Data Documentation

a) BLM policy requires the development of FGDC compliant metadata for spatial and non-spatial data. The primary documents that establish this policy are the:
- Metadata Content Standard (www.fgdc.gov),
- BLM Data Management Handbook (H-1283-1, especially Chapter 6: Metadata and Data Documentation),
- BLM Land Use Planning Handbook (H-1601-1),
- BLM Land Use Planning Handbook (M-1601, especially Appendix G: Managing and Applying Data and Information).

b) Please see the Appendix XX: Related References for external links to these documents. This policy supports data meeting the requirements of the Information Quality Act of 2002 for transparent and reproducible data. The Content Standard for Digital Geospatial Metadata (CSDGM), Version 2, (FGDC-STD-001-1998) is the US Federal Metadata standard. The Federal Geographic Data Committee originally adopted the CSDGM in 1994 and revised it in 1998. According to Executive Order 12096, all Federal agencies

are ordered to use this standard to document geospatial data created as of January, 1995. The standard is often referred to as the FGDC Metadata Standard and has been implemented beyond the federal level with State and local governments adopting the metadata standard as well. Please see Appendix 1: Related Resources for the link to this standard.

c) To ensure that the metadata collected under this policy meet BLM's needs, the BLM developed a Guide for FGDC Metadata Implementation. This guidance is provided in the form of a template that shows which elements are required to be populated and which elements are recommended. It is recommended that contractors performing data collection for BLM use this guidance to collect FGDC compliant metadata that will satisfy the BLM requirements. The Internal Data Management Webpage where the BLM FGDC Metadata Template MS Word document is located: http://web.blm.gov/data_mgt/guidelines/index.htm. The file is also included in the Attachments folder.

d) The BLM's data resources are high-value business assets that must be documented and maintained in accordance with other critical business assets. Metadata allow internal and external customers to improve business and technical understanding of data and data-related processes by helping them to:
   1. Find and access the data;
   2. Understand data that are found;
   3. Understand the reliability of data;
   4. Understand the intended use of the data;
   5. Know how and when the data were collected and by whom;
   6. Know how and when data are maintained;
   7. Understand any ways in which the data are manipulated; and
   8. See any warnings or disclaimers that may apply to the data.

e) A successful land use planning effort always employs rigorous standards for maintaining, managing, and applying data and derived information. Standardized, accurate, and reliable data and information are critical to the development of plan assessments, alternatives, impact analyses, and planning decisions. All data used in supporting planning decisions are considered corporate data. Corporate data are those data and applications that are exchanged across administrative units, shared with the public, used repetitively through time, and applied in decision-making.

f) The data and resultant information for a land use plan must be carefully managed, documented, and applied to withstand public, scientific, and legal scrutiny, and at the same time, facilitate the efficient development and operation of the Bureau's mapping and data management systems such as GIS. For these reasons, the corporate data used in plans require a high level of consistency, standardization, and established quality control procedures.

g) Metadata is the term used to describe the content, quality, condition, and other characteristics of data. By Executive Order, geospatial data used by the Bureau must be: (1) accompanied by metadata in the format set forth by the Federal Geographic Data Committee and (2) be accessible to all interested parties. The BLM also requires that non-spatial planning data be accompanied by Federal Geographic Data Committee-compliant metadata. In developing a plan, a distinction must be made between new data and existing data. New data includes both raw data and derived information or products

such as new GIS themes, or the results of applying new analyses or modeling methods. New data may be collected by BLM or contractors, or it may be acquired from external sources. For additional information on metadata requirements, metadata fields, and standards, refer to the BLM Data Administration Handbook (H-1283) and the BLM Intranet through the IRM Data Management website. The site contains information on project contacts and assistance, frequently asked questions, guidelines and directives, a data standards reference library, data quality, and a data management toolkit.

28. Quality Assurance

a) Guidance
- For BLM purposes, data quality means "***fitness for the intended use***." Data quality may be considered as the sum of all data characteristics that determine how useful the data are in performing specific business processes.
- There is no universal quantitative standard of quality that all BLM data should meet. Rather, the right quality is the quality that minimizes the risk of failure. The International Standards Organization (ISO) also defines "quality" in a way that supports this viewpoint. ISO 8402 defines quality as: "The totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs."
- The DOI Office issued data quality guidance in August of 2008. The "Data Quality Management Guide" is to be used as guidance for evaluating data quality for DOI and thus BLM. The documentation has numerous examples of methods for measuring alpha-numeric data quality and thus geospatial attribute quality. While there are no specific examples for geospatial data quality measures relating to geometry or topology, there is a draft addendum available that addresses those issues.
- The Data Quality Act requires agencies to maximize Data Quality, including Objectivity, Utility, and Integrity

b) Goals/Objectives
- Ensure data are the right type, quality, and quantity to meet REA objectives
- Ensure QA/QC guidelines are relevant to REA objectives
- Identify conditions under which deliverables will be accepted or rejected
- Provide information to AMT so they feel reasonably comfortable that the data that is critical to addressing a management question is "***correct enough***"

c) Characteristics of Data Quality
- ***Objectivity*** consists of: 1) presentation, which focuses on whether disseminated information is being presented in an accurate, clear, complete, and unbiased manner within a proper context, and 2) substance, which focuses on ensuring accurate, usable, and reliable information
- ***Utility*** refers to the usefulness of the information to its intended users, from the perspectives of both internal network users and the general public
- ***Integrity*** refers to the security of information, e.g., protection from unauthorized access or revision to ensure that the information is not compromised through corruption or falsification
- From these characteristics, DOI guidance identifies eleven criteria by which data quality can be evaluated (DOI 2008); these criteria are provided in Table 3 below

Table 3: Data Quality Criteria (Source: DOI Data Quality Management Guide, 2008. http://www.myinterior.doi.net/ocio/architecture/policy.html)

Dimensions	Quality Dimensions Description	Example of Non-Quality Data
Validity	The degree to which the data conform to their definitions, domain values, and business rules	A U.S. address has a state abbreviation that is not a valid abbreviation (not in the valid state abbreviation list)
Non-Duplication	The degree to which there are no redundant occurrences or records of the same real world object or event	One applicant has multiple applicant records (evident when an applicant gets duplicate, even conflicting, notices)
Completeness	The degree to which the required data are known. This includes having the required data elements (the facts about the object or event), having the required records, and having the required values.	An indicator for spouse is set to "yes", but spousal data are not present
Relationship Validity	The degree to which related data conform to the associative business rules	A property address shows a Michigan zip code, but a Florida city and state
Consistency	The degree to which redundant facts are equivalent across two or more databases in which the facts are maintained	The same applicant is present in two databases or systems and has a different name or address or has different dependents
Concurrency	The timing of updates to ensure that duplicate data stored in redundant files are equivalent. This is a measure of the data float (the time elapsed from the initial acquisition of the data in one file or table to the time they are propagated to another file or table).	On Monday, an applicant's change of address is updated in the Applicant record of origin file, but the record is propagated to the main Program database after the weekend cycle (Friday night). That record has a concurrency float of five days between the record-of-origin file and the record-of-reference database.
Timeliness	The degree to which data are available to support a given information consumer or process when required	A change of address is needed to schedule an inspection but is not available to the field office, and the inspector leaves without the proper data
Spatial Accurate	The degree to which data accurately reflect the real-world object or event being described. Includes spatial, temporal and thematic accuracy	The home telephone number for a customer's record does not match the actual telephone number
Thematic Accuracy	The degree to which the attributes represented in the map are reflective of	Management guidance determines that classification accuracy of sagebrush must exceed 70% for it to be useful for

Dimensions	Quality Dimensions Description	Example of Non-Quality Data
	reality on the ground	assessment
Precision	The degree to which data are known to the right level of detail (e.g., the right number of decimal digits to the right of the decimal point). Includes spatial, temporal and thematic precision.	A measurement of water quality only recorded concentrations in parts per thousand whereas known contaminants can cause serious illness when found in concentrations of parts per million
Derivation Integrity	The correctness with which derived data are calculated from their base data	Conservation Element opportunity dataset is based on federal ownership and the not coincident with Surface Management Agency data

d) Analysis of GIS deliverables by DMT will focus on spatial geometries, attribute tables, and metadata compliance
   - Ensure deliverables adhere to base standards for file formats, projections, datum, file naming conventions, etc.
   - Visual inspection – This will include checking for edge-matching and logical consistency with other datasets
   - Analysis of data tables to ensure consistency, attribute normalization, identification of outliers
   - Metadata will be analyzed through an in-house tool to ensure required elements have been completed
   - Where a reference source exists for comparison, NOC will evaluate datasets against National Standard for Spatial Data Accuracy (NSSDA)

29. Data Distribution

a) Data Ownership
   - All derived data models, products, code, etc. are property of the BLM
   - Individual data layers supplied by other sources are the property of and under the stewardship of the source organization. The REA Data Coordinator is responsible for maintaining an index catalog of the source data.
   - BLM data may not be trademarked or copyrighted

b) Data Use Agreements
   - The BLM must exercise due diligence in its use of non-BLM geospatial data. Therefore, the following information MUST be known and documented in the Pre-Assessment Phase and before downloading:
     - ◊ Do metadata exist?
     - ◊ Are there any use/access restrictions?
     - ◊ Are there known source and contact information for the data?
     - ◊ Are any attribute codes explained adequately in the metadata?
       - If no, are the codes explained in an easily available document?
     - ◊ Are units of measure clear in the attributes?

- ◊ Are the projection and datum known?
- ◊ Might the data be sensitive (i.e. archaeological, cave, sensitive species, trademark, copyright, commercially protected or homeland security protected information)?

c) After the data is downloaded, the following information must be known and documented in the metadata:
- Is there any Privacy Act personal information contained in the data?
  - ◊ Is there any confidential information that may be one of the nine FOIA exceptions? Please see Appendix 10 FOIA Exceptions from http://www.doi.gov/foia/foiahandbook.html
- Can BLM share the data with others via the internet without written permission?
  - ◊ If no, can the BLM share the data with others if written permission is granted?
- Can "value added" information be incorporated and shared by BLM without restrictions?

d) If data are acquired from a public internet site but do not include any information in the Use or the Constraints portion of the metadata (or do not have metadata), then the BLM or its contractor will label the data as public. One exception to this rule of thumb is data downloaded from the internet that contain Privacy Act or personally identifiable information. Please see section below on "Access".

e) Whenever data are **not** collected from a public internet source and an assessment for Privacy Act information or confidential data is not documented in the metadata, the data are to be treated as confidential information. In such an instance, the BLM and its contractors will attempt to secure an assessment from the source agency and approval to include that assessment in the metadata. If the assessment and approval are not forthcoming from the source, the data will be documented as "Confidential" and subsequent users must contact the source agency for viewing or use of the data. Further use of such data by the BLM for GSGI processes must be made on a case by case basis by the BLM NOC Geospatial Data Coordinator or the GSGI Data Management POC.

f) Data Share Agreement
- All BLM contractors will be handling confidential data. Therefore, a confidential data sharing agreement between the contractor and the BLM must be completed. Likewise, any partner agency or other entity that would like access to BLM confidential data, either to view a map containing confidential information or to download the data, must also complete a Confidential Data Sharing Agreement according to BLM Records Management Policy contained in Manual 1278.
- A sample data sharing agreement is included as a *File Attachment*. Data sharing agreements, when possible, should be completed at the national, rather than the state level.

g) Disclaimer
- The following disclaimer statements are applied to BLM data, as appropriate, depending on the BLM Records Access Category and the data verification status for the data involved.
- For Public records (external distribution) and those discretionary/enhanced records (electronic products available for online viewing and/or hardcopy output available to the public) the following disclaimer should be used:

"The U.S. Bureau of Land Management (US-BLM) makes no representations or warranties regarding the accuracy or completeness of the attached files or the data from which it was derived. The US-BLM shall not be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this file or the data from which it was derived. Because the files are merely representational, it and the data from which it was derived are not binding on the US DOI BLM and may be revised at any time in the future."

Use Constraints: These data are public information and may be used and interpreted by organizations, agencies, units of government, or others. The user has sole responsibility for ensuring the appropriate application of these data and the U.S. Bureau of Land Management shall not be held liable for any use or misuse of the data described hereon. Generally, these data are intended for small scale (1:100,000 and smaller) natural resource management and planning applications. It is strongly recommended that these data be acquired directly from the U.S. Bureau of Land Management and not indirectly through some other source which may have changed the data. It is also strongly recommended that careful attention be paid to the content of the metadata file associated with these data. Users are cautioned that digital enlargement of these data to scales larger than that at which they were originally mapped can cause misinterpretation. Users are further cautioned that these data, and any interpretations derived from them, do not eliminate the need for onsite survey and evaluation of specific sites for intensive uses.

- For Internal or Confidential records, or records only accessible by internal staff, for review or display with no intended distribution, or containing unverified data use:

"For internal use only. Review and/or display copy – not for distribution. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. [Date]"

30. Data Dissemination

a) Internal
   - Access to data at the NOC will be provided internally through ArcGIS Sever and through the BLM DFS structure

b) External
   - As public datasets are approved by the data steward for release, they will be posted on the BLM public ftp site for dissemination to the public, partner agencies and the scientific community. The metadata will be posted in FGDC nodes to allow harvesting of the data through nationally recognized geospatial portals.

c) When the Geospatial Information Portal project has implemented a public internet site with hardware, software and network capability to serve live mapping products, the data, models, and derived products will be available to external users through the use of ArcServer technology. This may be subject to change based on management direction.

31. Backups, Records Management and Archives

a) EIS represent "snapshots" of conditions and analysis alternative comparisons at a particular point in time. As such, much like Land Use Planning documents, the data used for the GSGI project need to be time-stamped.

b) Back-Ups
   - The digital GSGI vector data, documents, and products that reside on the BLM computer system will be backed up by the federal Information Resources Management System on a daily, weekly and monthly retention schedule. This back up schedule applies to files on the DFS system and files that are loaded in the Spatial Database Engine. The NOC GIS Coordinator will provide information on the specific files to be backed up. Contractors must assure that work in development for this project will be backed up on a similar schedule until such a time as the contract is completed and closed.
   - Because raster datasets are large and static, they need only be backed up once upon acquisition, then annually thereafter

c) Data Archives
   - All data, documents and products acquired or generated for the GSGI will require permanent retention under BLM Manual 1220, Appendix 2, GRS/BLM Combined Records Schedules in Schedule 20 and 17 which pertain to Electronic Records and Cartographic Products, respectively
   - The project folder should be self-contained, with a frozen copy of all data used in the assessment.

d) Additionally, these documents must be retained and accessed as a group for access by FOIA requestors. All data must also be converted to geodatabases and shipped with supporting documents (including digital photographs, if any, to the National Archives and Records Administration (NARA) digital records location (please note that NARA standards require that photographs must be taken with a minimum of a 6 megapixel camera) Permanent retention of the data and shipment to NARA is included in the BLM Records Manual 1220 Schedule 17.

e) The GSGI Data Coordinator is responsible for ensuring that the NARA archiving is completed upon the finalization of their project. The NOC GIS Coordinator is responsible for ensuring that the digital database is archived internally for permanent retention on an annual basis.

32. GSG Initiative Budget Requirements

a) FY '12 – Activities to support includes Scoping, Alternatives Definition, Cumulative Effects, Sub-Regional EIS Interdisciplinary Teams, National Policy Team, Regional Management Teams, WO Management/Public Affairs, and provide data support to the field under the Interim Guidance IM.

• Project Management	$ 50,000
• Data Preparation	$200,000
• Data Management	$ 50,000
• NOC DIRM	$100,000
• Web Services	$100,000[1]
• Total	$500,000

b) FY '13 - Activities to support include Sub-Regional FEIS Interdisciplinary Teams, approximately 96 RMP amendments, National Policy Team, Regional Management Teams, WO Management/Public Affairs and provide data support to the field under the Interim Guidance IM.

• Project Management	$ 50,000
• Data Preparation	$ 50,000
• Data Management	$ 50,000
• NOC DIRM	$ 50,000
• Web Services	$100,000[1]
• Total	$300,000

c) FY '14- Activities to support include Sub-Regional FEIS Interdisciplinary Teams, approximately 96 RMP amendments, National Policy Team, Regional Management Teams, WO Management/Public Affairs and provide data support to the field under the Interim Guidance IM.

• Project Management	$ 25,000
• Data Preparation	$ 25,000
• Data Management	$ 50,000
• NOC DIRM	$ 50,000
• Web Services	$100,000[1]
• Total	$250,000

[1]Assumes that hardware and software at the NOC are available and staffed sufficiently to use to provide the internal web services required to support the field implement the Interim GSGI IM. Also assumes that external web services to partners and the public will be covered by the Geospatial Publication Initiative (GeoCommunicator Replacement by WO-300.

33. GSG Initiative Risk Factors

a) Network Capability Limitations
- BLM/DOI Network unable to support virtual GIS Teams with GSGI geospatial data centrally located at the NOC.

b) Funding Limitations
- Insufficient funding to support the new and unplanned workload as identified in **Section 32**.

c) Time/Schedule
- GSG Initiative has already been initiated with no data management plan, assignment of Roles and Responsibilities, or data preparation.

d) Insufficient Data
- Although National Data Standards development has been a GSSP priority since 2009, the establishment of national standards does not immediately convert existing data to those standards.
- Program and Management leadership is required if Field Specialists (data stewards) are to be allocated time and support to update their data to the new Standards.

- Not all of the data required to support this project have defined National data standards.

e) Lack of access to web services (internal/External)
   - Actions by the Department and IRM have limited access the Bureau's access and use of internal Web Services to support Bureau work.
   - The GeoCommunicator Replacement Project (GPI) does not envision either internal or external web services available until 2013.
   - The existing GPI timeline is detrimental to the success of the GSG Initiative.

f) Insufficient Staff Resources
   - The existing staffing at the NOC was not designed to support this level of geospatial data and technology as a central source for such extensive operations.
   - NOC DIRM Support – currently no dedicated Systems Analysts or Database Administrators to eGIS.
     ◊ MOU currently under development.
   - NOC DRS Support
     ◊ Managing for Excellence did not allocate a GIS capability to the NOC, it envisioned that the field does GIS.
     ◊ Existing staffing at the NOC are already allocated to support National Data Standards effort, support of the "NOC-assisted States" (AZ, CO, ES, NV & WY).
   - States/Field Office Support
     ◊ The Bureau's primary geospatial data and analytical capability is located in the field.
     ◊ These resources will have to be assigned to support the GSG Initiative, just like the sub-Regional EIS Interdisciplinary Teams have been assigned from the field. By centralizing the data and analysis at the NOC, virtual teams of GIS analysts and data management experts can be assigned tasks under the project.
     ◊ The risk is that these assignments will not be supported by the States.

g) Insufficient Technological Resources, States, eGIS/NOC Hardware/Software
   - The existing Enterprise GIS strategy was never funded as a Bureau-wide asset and technology has been adopted only as States and Offices were capable and choose to do so.
   - The GSG Initiative envisions a landscape management approach to management and decision making. The existing infrastructure may require upgrades and additions (particularly in the use of internal web services) if the project is to be successfully supported.

34. Document Maintenance

a) As BLM's GSG Initiative evolves in both the short-term and long, the DMP will be modified to reflect new information
b) Laws, policies, technologies, associated programs, and data management practices are all subject to change and this document will subsequently change to reflect those changes
c) Major changes to this document will be cleared and approved through the National GSG Coordination Team

d) Minor changes will be made immediately and any affected parties will be contacted by the Data Coordinator

Appendix 1: Related References

Data Administration/Management

- BLM Handbook H 1283-1 Data Administration and Management
  - http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.17422.File.dat/h1283-1.pdf
- Managing BLM Data as a Valued Asset (August 2002
  - http://web.blm.gov/data_mgt/dmp/dmp_guide_datamgt_pt1-pt2.pdf
- Data Management Links
  - http://web.blm.gov/data_mgt/dmp/toolkit/links.html
- BLM Data Quality Guidelines/Bulletin (web page)
  - http://www.blm.gov/wo/st/en/national_page/Notices_used_in_Footer/data_quality.html
  - Guidelines:
    - http://www.blm.gov/style/medialib/blm/national/national_page.Par.7549.File.dat/guidelines.pdf
- Data Management Strategy and Tactical Plan (draft)
  - http://web.blm.gov/data_mgt/guidelines/draft_dms_v_03_July2008.doc (size of bullets seem different for these three)
- BLM Manual 1601 Land Use Planning Manual
  - http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.96580.File.dat/1601.pdff
- BLM Handbook 1601-1 Land Use Planning Handbook
  - http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.38665.File.dat/h1601-1.pdf
- IM 2003-238, Guidance for Data Management in Land Use Planning
- BLM Manual 1220 - Records and Information Management and Appendix 2 - GRS/BLM Combined Records Schedules
  - http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.94023.File.dat/1220.pdf
  - http://www.blm.gov/wo/st/en/info/regulations/combined_record_schedules.html
- Department of the Interior Freedom of Information Act Manual
  - http://www.doi.gov/foia/foiahandbook.html
- BLM Records Administration Manual 1270
  - http://web.blm.gov/data_mgt/training/documents/ds_docs/L1_H-1270-1.pdf
- BLM Manual 1278 External Access to BLM Records
  - http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.76389.File.dat/1278.pdf

National Standards

- BLM National Data Standards
  - http://web.blm.gov/data_mgt/standards
- BLM Manual 4180 Rangeland Health

- Federal Geographic Data Committee Metadata Content Standard
  - http://www.fgdc.gov/metadata/geospatial-metadata-standards
  - BLM FGDC Metadata template: http://web.blm.gov/data_mgt/guidelines/index.htm

Data Stewards

- National Data Stewardship
  - http://web.blm.gov/data_mgt/data_steward/index.htm
- National Data Stewards
  - http://ilmniop3ap6/datashopper/data_stewards.asp
- Data Management for Data Stewards – Glossary of Terms
  - http://web.blm.gov/data_mgt/training/documents/ds_docs/R_Glossary_081008.doc

National Systems

- National Archives & Records Administration (NARA)
  - www.archives.gov

FOIA

- Freedom of Information Act
  - http://www.pueblo.gsa.gov/cic_text/fed_prog/foia/foia.htm

Privacy

- Privacy Act
  - http://www.usdoj.gov/oip/privstat.htm

Data Quality

- Information/Data Quality Act
  - DOI Data Quality Management Guide Memo
    - http://web.blm.gov/data_mgt/guidelines/DOI_DQ_IM_080822.pdf
  - DOI Data Quality Management Guide
    - http://web.blm.gov/data_mgt/guidelines/DOI_DQ_Guide_080822.doc
  - Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies
    - http://www.whitehouse.gov/omb/fedreg/reproducible.html

Nine Exemptions, DOI FOIA Handbook 383 DM 15

5.1 General. Under the FOIA there are nine exemptions and three law enforcement exclusions that serve as a basis for withholding information from the public. The nine exemptions are listed below and discussed at length in this chapter.

Exemption 1 - Matters of National Defense or Foreign Policy
Exemption 2 - Internal Personnel Rules and Practices
Exemption 3 - Information Exempted by Other Statutes
Exemption 4 - Trade Secrets, Commercial or Financial Information (Confidential Business Information)
Exemption 5 - Privileged Interagency or Intra-agency Memoranda or Letters

Exemption 6 - Personal Information Affecting an Individual's Privacy
Exemption 7 - Records Compiled for Law Enforcement Purposes
Exemption 8 - Records of Financial Institutions
Exemption 9 - Geological and Geophysical Information Concerning Wells

For more information, refer to Chapter 5 of the FOIA Manual, found at

http://www.doi.gov/foia/handbook/Chapter%205%20FOIA%20Exemptions.Feb%2026,%202004.pdf

Appendix 2: Project Parameters

1. **Greater Sage Grouse Initiative**
    - Planar:
    - Map_Projection:
    - Map_Projection_Name: Albers Conical Equal Area
    - Albers_Conical_Equal_Area:
    - Standard_Parallel: 29.500000
    - Standard_Parallel: 45.500000
    - Longitude_of_Central_Meridian: -96.000000
    - Latitude_of_Projection_Origin: 23.000000
    - False_Easting: 0.000000
    - False_Northing: 0.000000
    - Planar_Coordinate_Information:
    - Planar_Coordinate_Encoding_Method: row and column
    - Coordinate_Representation:
    - Abscissa_Resolution: 30.000000
    - Ordinate_Resolution: 30.000000
    - Planar_Distance_Units: meters

Appendix 3: ISO 19115 Topic Categories

To be ISO (International Standards Organization) compliant at this time, using ArcCatalog, add ISO keyword (text below within parentheses) and cite *ISO 19115 Topic Category* as Theme Keyword Thesaurus. Also use appropriate Content Type (Distribution tab, Resource Description) found at bottom of this document.

ISO keywords

- (**boundaries**)—Legal land descriptions
- (**farming**)—The rearing of animals or cultivation of plants. For example, resources describing irrigation, aquaculture, herding, and pests and diseases affecting crops and livestock.
- (**climatologyMeteorologyAtmosphere**)—Atmospheric processes and phenomena. For example, resources describing cloud cover, weather, atmospheric conditions, climate change, and precipitation.
- (**biota**)—Naturally occurring flora and fauna. For example, resources describing wildlife, biological sciences, ecology, wilderness, sea life, wetlands, and habitats.
- (**economy**)—Economic activities or employment. For example, resources describing labor, revenue, commerce, industry, tourism and ecotourism, forestry, fisheries, commercial or subsistence hunting, and exploration and exploitation of resources, such as minerals, oil, and gas.
- (**planningCadastre**)—Land use. For example, resources describing zoning maps, cadastral surveys, and land ownership.
- (**society**)—The characteristics of societies and cultures. For example, resources describing natural settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, crime and justice, recreational areas and activities, social impact assessments, and census information.
- (**elevation**)—Height above or below sea level. For example, resources describing altitude, bathymetry, digital elevation models, slope, and products derived from this information.
- (**environment**)—Environmental resources, protection, and conservation. For example, resources describing pollution, waste storage and treatment, environmental impact assessment, environmental risk, and nature reserves.
- (**structure**)—Man-made construction. For example, resources describing buildings, museums, churches, schools, hospitals, factories, housing, monuments, and towers.
- (**geoscientificInformation**)—The earth sciences. For example, resources describing geophysical features and processes; minerals; the composition, structure, and origin of the earth's rocks; earthquakes; volcanic activity; landslides; gravity information; soils; permafrost; hydrogeology; and erosion.
- (**health**)—Health services, human ecology, and safety. For example, resources describing human disease and illness, factors affecting health, hygiene, mental and physical health, substance abuse, and health services.
- (**imageryBaseMapsEarthCover**)—Basemaps. For example, resources describing land cover, topographic maps, and classified and unclassified images.
- (**inlandWaters**)—Inland water features, drainage systems, and their characteristics. For example, resources describing rivers and glaciers, salt lakes, water use plans, dams, currents, floods, water quality, and hydrographic charts.
- (**location**)—Positional information and services. For example, resources describing addresses, geodetic networks, postal zones and services, control points, and place names.
- (**intelligenceMilitary**)—Military bases, structures, and activities. For example, resources describing barracks, training grounds, military transportation, and information collection.

- (**oceans**)—The features and characteristics of salt water bodies excluding inland waters. For example, resources describing tides, tidal waves, coastal information, and reefs.
- (**transportation**)—The means and aids for conveying people and goods. For example, resources describing roads, airports and airstrips, shipping routes, tunnels, nautical charts, vehicle or vessel location, aeronautical charts, and railways.
- (**utilitiesCommunication**)— Energy, water and waste systems, and communications infrastructure and services. For example, resources describing hydroelectricity, geothermal, solar, and nuclear sources of energy, water purification and distribution, sewage collection and disposal, electricity and gas distribution, data communication, telecommunication, radio, and communication networks.

Appendix 4: File Naming Conventions

The NOC Data Standards team has instituted the use of naming conventions for all data standards to keep names consistent across the Bureau. Doing so will eliminate using different names for the same data layer, or using the same name for different layers. In addition, when searching through large data stores, locating data that are related to each other is simplified by the use of standardized names.

The ESRI multi-user geodatabase sits on an RDBMS platform which creates tables for the individual feature classes. These tables must have a unique name. We devised this solution in coordination with State GIS administrators because multiple geodatabase instances are not practical in an SDE environment. This will aid in building and maintaining the enterprise GIS environment. The REA program will follow the file naming conventions as much as possible with a few slight variations to account for the unique nature of these assessments.

Basic Requirements

- No spaces or special characters can be used in filenames
- Use underscores to separate characters, except where noted to preserve the 13-character limit of Grid files
- ESRI Grid files cannot have names longer than 13 characters
- See below for specific requirements for each type of file and examples of acceptable file names.
- Note, for GSGI products, it is very important that spatial data files are prefixed with the corresponding three-letter code for the Ecoregion they cover, and are otherwise unique from any other file. The Ecoregion codes can be found in Appendix 5 Table 4, and additional codes are listed in the Appendix 5 figures, which will help build files that are unique.

1. Terrestrial and Aquatic_Riparian: Species-Level Conservation Elements filenames will use the 6-digit Taxonomic Serial Number used by the International Taxonomic Information System (http://www.itis.gov/) to uniquely identify each species

2. Aquatic_Riparian and Terrestrial: Ecosystem-level Conservation Elements filenames will use standard ecosystem codes to be developed during the Pre-Assessment phase of the REA.
3. Native Vegetation-level Conservation Elements filenames will use native standardized codes used within the source datasets from which they are derived.
4. Indicator dataset filenamess will include standard indicator codes developed during the Pre-Assessment phase of the REA.

5. If space permits, geodatabases should include an abbreviation of the Data Standard they follow. These are lowercase, as the following examples illustrate:
   - acec – Areas of Critical Environmental Concern
   - gra – Grazing (allotments and pastures)
   - isma – Invasive Species Management Areas
   - lhrs – Land Health Reporting Standards
   - lupa – Land Use Planning Area boundaries
   - nlcs – National Landscape Conservation System
   - tga – Taylor Grazing Act
   - vri – Visual Resource Inventory
   - nhd – National Hydrography Dataset

   (Note: See full current and proposed listing at the end of the document.) For data layers not previously identified and assigned a prefix code, please contact the NOC Data Management team.

6. Feature class, relationship classes, and tables should include a lower case suffix that designates the type of data. These are:
   - poly – polygon feature classes with attributes (i.e. status, acres, reporting category)
   - ln – arc feature class containing linear features. These feature classes represent roads, rivers, trails, etc. and have attributes for both the feature level metadata and attributes specific to the feature (i.e. river name, case file number, miles, status).
   - tbl – table containing information that should be provided by the GIS user. Generally, these tables are related to one of the feature classes.
   - rel – relationship class that links one element of the geodatabase to another element of the geodatabase. These usually relate a feature class to a table.

Appendix 5: Definitions

- **Attribute Table:**
  - A table containing a collection of data in rows (records) and columns (fields) with information pertaining to spatial attributes about a specific object within a feature dataset.
- **Authored Data Source:**
  - Non unique author of the data
  - Most of the source data was authored by BLM California
- **Authoritative Data Source:**
  - Unique author of the data
  - A single officially designated source authorized to provide a type or many types of information that is trusted, timely and reliable (DOI DAC)
  - Source data authored by BLM California, and officially recognized as the authoritative source
- **ArcSDE:**
  - ArcSDE (Spatial Database Engine) is server software by ESRI that spatially enables a Relational Database Management System. The spatial data may then be used as part of a geodatabase.
- **Data:**
  - A representation of facts, concepts or instructions (structured, semi-structured, or unstructured) in a formalized manner suitable for communication, interpretation or processing by people or by machines (DOI Manual Part 378 - Data Resource Management Program) **Data Management for Data Stewards – Glossary of Terms** http://web.blm.gov/data_mgt/training/documents/ds_docs/R_Glossary_081008.doc
- **Data Catalog:**
  - Provides automated access to information and data locations for California
- **Data Maintainer:**
  - A person who performs data entry and data maintenance at the system level on a regular basis. This person may or may not be a specialist in the business area in which they are working but are technically proficient at using the software application which is used to store and maintain the data.
- **Data Management:**
  - The development and execution of a set of policies, practices, disciplines, methods, and procedures that ensure currency, meaning, and quality of a company's enterprise data
- **Data Steward:**
  - The person most knowledgeable about the resource or program who ensures that pertinent data meets any defined data standards and accurately describes the resource for which they have responsibility. Data stewards are responsible for manage data with proper regard to the informational needs of others.
- **Datum:**
  - A geodetic datum is a reference from which measurements are made. In surveying and geodesy, a datum is a set of reference points on the Earth's surface against which position measurements are made, and (often) an associated model of the shape of the earth (reference ellipsoid) to define a geographic coordinate system.

- **Domains:**
  - Rules that describe the legal values of a field type, providing a method for enforcing data integrity.
- **EGIS:**
  - Enterprise Geographic Information System, an integrated, multidepartment GIS composed of interoperable components.
- **ESRI:**
  - A software development and services company providing Geographic Information System (GIS) software and geodatabase management applications, specifically, the ArcGIS Desktop suite of products.
- **Feature Classes:**
  - homogeneous collections of common features, each having the same spatial representation, such as points, lines, or polygons, and a common set of attribute columns.
- **FGDC:**
  - Federal Geographic Data Committee (FGDC) is a United States government committee which promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis.
- **Geodatabase:**
  - A database designed to store, query, and manipulate geographic information and spatial data.
- **GeoProcesses:**
- **GSGI**
  - Greater Sage Grouse Initiative
- **LandSAT:**
  - The LandSAT program is the longest running enterprise for acquisition of imagery of Earth from space
- **Lead Data Maintainer:**
  - Person responsible for enterprise data set within the GIS environment
- **LIDAR:**
  - Light Detection And Ranging (LIDAR) is an optical remote sensing technology that measures properties of scattered light to find range and/or other information of a distant target using high frequency laser pulses to determine distance to an object or surface.
- **Metadata:**
  - Documentation about data or a data set. Metadata describes the content, quality, condition, limitation, source, and other characteristics of data. Metadata is vital in helping potential users to find needed data and determine whether a data set will meet their needs before they spend the time and money to obtain and process it.
- **MXD:**
  - File extension indicating a GIS project file (Map)
- **NAIP:**
  - The National Agriculture Imagery Program (NAIP) acquires aerial imagery during the agricultural growing seasons in the continental U.S. A primary goal of the NAIP program

is to make digital ortho photography available to governmental agencies and the public within a year of acquisition.

- **PMU:**
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- **PPH:**
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- **Recycled Data:**
  - Data authored outside of California. Data may be reformatted to improve usage.
- **Relationship Class:**
  - A relationship between any feature class and table within your geodatabase created by using tools in ArcCatalog. These tools can be used to create simple, composite, and attributed relationship classes.
- **ODBMS:**
  - Object Data Base Management System
  - Software system that lets you create, update, and administer a set of objects
- **Projection**
  - A projection is any method of representing the surface of a sphere or other shape on a plane with the aim of minimizing distortion associated with the transition from a 3D surface to a 2D surface.
- **Project Lead:**
  - Person leading an interdisciplinary team
- **Raster:**
  - Any type of digital image represented in grid format consisting of rows and columns of cells, with each cell storing a single value.
- **RDBMS:**
  - Relational Data Base Management System
  - Software that lets you create, update, and administer a set of data
- **Relationship classes:**
  - An association between two object classes (i.e., feature classes or tables).
- **Confidential/Proprietary Data:**
  - Data that requires protection due to the risk and magnitude of loss or harm which would result from inadvertent or deliberate disclosure, alteration, or destruction. Data not releasable under the Freedom of Information Act (FOIA).
- **Schroeder Sage Grouse Range Map**
  -
- **Spatial Objects:**
  - Objects such as roads, lakes, wilderness areas represented on the earth
- **Statewide Data:**
  - BLM California created or value added data
- **Value Added Data (decision):**
  - The data represents decision objects, most objects cannot be derived from observable features. Much of the source data was authored outside of BLM, however the data either contains additional records or the source geometry and/or field attributes have been changed.
- **Value Added Data (physical):**

- The data represents physical objects, and can be derived from observable features. Much of the source data was authored outside of BLM, however the data either contains additional records or the source geometry and/or field attributes have been changed.

- **Value Added Data Source:**
  - Data from another party which has had geometry, and/or attributes changes. Reformatting data may ease data use, but does not add value to the data.
- **Vector:**
  - Representation of physical and/or geographical features as geometrical shapes. Different features are expressed by different types of geometry, primarily by points, lines, and polygons.
- **Workflows** (data management)
  - Sequence of operations related to the management of data